DEPARTMENT OF THE ARMY
Omaha District, Corps of Engineers
106 South 15th Street
Omaha, Nebraska 68102-1618

:NOTICE: Failure to acknowledge : :all amendments may cause rejec- : :tion of the bid. See FAR : :52.214-3 of Section 00100 :	Solicitation No. DACW45 03 B 0010 Date of Issue: 31 Mar 2003 Date of Opening: 30 May 2003

Amendment No. 0003
16 May 2003

SUBJECT: Amendment No. 0003 to Specifications and Drawings for Construction of **Rearing Ponds and Hatchery Complex, Fort Peck Fish Hatchery, Fort Peck, MT.**
Solicitation No. DACW45 03 B 0010.

TO: Prospective Bidders and Others Concerned

1. The specifications and drawings for subject project are hereby modified as follows (revise all specification indices, attachment lists, and drawing indices accordingly).

a. Specifications. (Descriptive Changes.)

(1) Page 00800 Page 13, paragraph 1.24.b, delete "$1,500,000" and substitute "$1,000,000."

(2) Section 02371 Page 4, Table 1, delete the Acceptable Values for the following and replace with the new values listed:

GRAB STRENGTH	LBS	"370"	ASTM D 4632
PUNCTURE	LBS	"170"	ASTM D 4833
TRAPEZOID TEAR	LBS	"145"	ASTM D 4533

(3) Section 05120a Page 5, Paragraph 2.8 PAINT; delete "Paint shall conform to SSPC Paint 25." and substitute, "Primer, intermediate coat and topcoat for surfaces of structural steel to receive polyurethane topcoat are specified in Specification Section 09900 PAINTS AND COATINGS. Primer for all other structural steel surfaces shall conform to SSPC Paint 25."

(4) Section 05120a Page 5, Paragraph 3.1 FABRICATION; delete second sentence "Structural steelwork, except surfaces of steel to be encased in concrete, surfaces to be field welded, and contact surfaces of friction-type high-strength bolted connections shall be prepared for painting in accordance with AISC ASC Manual and primed with the specified paint." and substitute "Structural steel listed in Specification Section 09900 PAINTINGS AND COATINGS, paragraph INTERIOR PAINT TABLES, Division INTERIOR METAL, FERROUS AND NON-FERROUS PAINT TABLE to receive polyurethane topcoat shall receive surface preparation, priming and painting in accordance with Section 09900. All other structural steelwork, except surfaces of steel to be encased in concrete, surfaces to be field welded, and contact surfaces of friction-type high-strength bolted connections shall be prepared for painting in accordance with AISC ASC Manual and primed with SSPC Paint 25."

(5) Section 05500A Page 6, paragraph 2.17 CANAL GATE, delete paragraph in it's entirety and substitute the following:

"2.17 ALUMINUM SLIDE GATES FOR CHIMNEYS.

Aluminum gates shall be constructed of 6061-T6 alloy and shall be the standard product of a company regularly engaged in the manufacture of aluminum slide gates. Aluminum gates shall be installed where shown on the drawings complete with all necessary appurtenances. Each gate shall be capable of withstanding a seating head of 10 feet without excessive distortion or leakage. Each gate shall provide an opening at least equal in size to the opening in the concrete wall as shown on the drawings. The gates shall be self-contained, rising stem with the guides designed to mount to the face of the concrete. The guides shall be of extruded aluminum designed for maximum rigidity and with keyways to lock them into the concrete. The invert of the frame shall be an angle welded to the lower ends of the guides to form a seating surface. The guides shall extend above the operating floor and shall be sufficiently strong so that no further reinforcing is required. The yoke to support the operating bench-stand shall be formed by two angles or channels welded at the top of the guides to provide a one-piece rigid frame. The maximum deflection of the yoke under full operating load shall be 1/360 of its span. The disc or slide shall be of aluminum plate reinforced with ""U" shaped aluminum extrusions welded to the plate. The disc shall not deflect more than 1/360 of the span on the gate under the design head. Reinforcing ribs shall extend into the guides so that they overlap the seating surface of the guide. A molded resilient seal shall be mounted on the bottom of the disc to provide flush-bottom closure. Operation of the gate shall be by a hand wheel operated benchstand mounted on the yoke of the gate. The operating stem shall be Type 303 or Type 304 stainless steel designed to have an L/r of less than 200 and to withstand in compression at least twice the rated output of the bench-stand. The stem shall be connected to the disc by a cast aluminum stem connector bolted to the stem and welded to the disc. All necessary attaching bolts and anchor bolts shall be stainless steel and shall be provided by the slide gate manufacturer. After installation, the gate assembly shall be tested in the presence of the Contracting Officer."

(6) Section 08361 Page 4, paragraph 2.2, line 8, delete "inchtracks" and substitute "inch tracks".

(7) Section 08361 Page 4, paragraph 2.4.1, line 1, delete "16 gage" and substitute "24 gage".

(8) Section 08520A Page 5, paragraph 2.1, add the following to the end of the paragraph:

"Window manufacturer's operable windows frames shall match the fixed window frame profile and depth as shown on the contract drawings. Manufacturer's standard window frame extensions shall be an integral frame unit and match properties of the fixed window frames. "

(9) Section 08710 Page 10, HW-4, delete "118" from the list of doors.

(10) Section 08710 Page 12, HW-15,
a) Change line 2 to read to read "2 Door Closure Type K81071F.."

b) add the following to the list:
"1/2 Pair Hinges Type A8111"

(11) Section 08710 Page 12, HW-16, delete "126" from the list of doors.

(12) Section 09900 Page 5, Paragraph 1.3.1,

a) 5th sentence, after "similar", add "industrial".
b) 5th sentence, delete "three years" and substitute "10 years".

(13) Section 09900 Page 5, Paragraph 1.3.2, delete the paragraph "SSPC QP 1 Certification" in its entirety and substitute "NOT USED".

(14) Section 11301A Page , replace paragraph 1.2.1.d with the following:

"d. Packed column dimensions

Maximum vertical projection:

5'-9" above tank sidewall for packed column height; 7'-4" to top of piping over packed column.

Maximum outside diameter:

As required to fit within tank openings and allow positioning. Contractor shall coordinate size of opening with tank manufacturer and shall make necessary adjustments at no additional cost to the Government. Adjustments to tank openings shall be made in the shop; no field adjustments to openings shall be made.

Minimum dimensions:

Minimum nominal inside dimensions shall be as indicated in the drawings and herein unless otherwise approved. If outside diameter is significantly less than indicated, Contractor shall adjust tank opening to limit maximum possible gap between packed column and edge of opening to 6 inches with packed column positioned to one side of the opening. Adjustments to tank openings shall be made in the shop; no field adjustments to openings shall be made. "

(15) Section 11301A Page 7, replace paragraph 2.2.5 with the following:

"2.2.5 Packed Column Shell Materials:

Packed column shells shall be constructed of fiberglass reinforced plastic (FRP), minimum 1/4" thickness galvanized steel, or suitable seamless one piece molded modular sections of a plastic material. Fabrication shall conform to the indicated details, or, for alternative designs, in accordance with the manufacturer's recommended fabrication procedures. The design, fabrication, and erection shall be as specified herein. "

(16) Section 13851A Page 11, paragraph 2.1.1, line 1, delete "168" and substitute "80".

(17) Section 13930A Page 5, paragraph 1.2.1, in the first

sentence change "3,000" to "2,000".

(18) Section 13930A Page 15, paragraph 3.4.1, delete this paragraph in its entirety.

(19) Section 16261A Page 12, paragraph 3.1.1, line 1, delete "necessary" and substitute "determined by the VFD and motor supplier"

b. Specifications (New and/or Revised and Reissued). Delete and substitute or add specification pages as noted below. The substituted pages are revised and reissued with this amendment.

Pages Deleted	Pages Substituted or Added
00010-3 & 00010-4	00010-3 & 00010-4
SECTION 02370A GEOMEMBRANE FOR PONDS	SECTION 02370A GEOMEMBRANE FOR PONDS
SECTION 13120 STANDARD METAL BUILDING SYSTEM	SECTION 13120 INSULATED METAL WALL PANELS AND MISCELLANEOUS COMPONENTS

c. Drawings (Not Reissued). The following drawing sheets are revised as indicated below with latest revision date of 16 May 2003. These drawings are not reissued with this amendment.

(1) Sheet U1-07,
   a) A 36" WD pipe is shown from the manhole #9 into the primary settling pond, change this pipe to read " 27" WD" pipe.
   b) A 30" WD pipe is shown from the manhole #10 into the primary settling pond, change this pipe to read " 27" WD" pipe.

(2) Sheet FP.2, In "Fire Sprinkler System Schedule, Area of Demand" column, change the "3,000" to "2,000" for all areas.

(3) Sheet M7.01, On plans, add typical section cut to trough, parallel to long direction, at drain end of trough "9/M8.03, TYPICAL AT ALL TROUGHS".

(4) Sheet M7.02, On plans, add typical section cut to trough, parallel to long direction, at drain end of trough "9/M8.03, TYPICAL AT ALL TROUGHS".

(5) Sheet M7.03,
   a) On plans, add typical section cut to trough, parallel to long direction, at drain end of trough "9/M8.03, TYPICAL AT ALL TROUGHS".
   b) In addition on M7.03, add horizontal section cut to tank at upper right "9/M8.03, TYPICAL AT ALL TANKS".

(6) Sheet M8.05, add the attached detail to this drawing sheet.

(7) Sheet M8.06,

a) Detail A: On right side, replace note reading "PLASTIC OR GALVANIZED CMP SHELL" with "FIBERGLASS, PLASTIC OR GALVANIZED STEEL SHEEL"

b) Detail 2: Add note to read: "FILTER INLET INVERT ELEV = 2082.29, FILTER OUTLET INVERT ELEV = 2081.62 +/-, UV DISCHARGE FLANGE ELEV = 2080.54. THESE ELEVATIONS ARE BASED ON ASSUMED EQUIPMENT DIMENSIONS. CONTRACTOR SHALL COORDINATE ALL ELEVATIONS WITH CONNECTIONS TO ADJACENT EQUIPMENT ACTUALLY PROVIDED. ADJUSTMENTS TO ELEVATIONS SHALL BE MADE AT NO ADDITIONAL COST TO THE GOVERNMENT.

(8) Sheet C1.02, correct the elevations on ponds 1 thru 8 to read "61.98" (8 places).

d. Drawings (Reissued). The following drawing sheets are revised with latest revision date of 16 May 2003, and reissued with this amendment.

FP22AC1.CAL	AC.01	COMPOSITE FLOOR PLAN
FP22AC2.CAL	AC.02	COMPOSITE UPPER LEVEL FLOOR PLAN
FP22A105.CAL	A1.05	FLOOR PLAN- AREA E
FP22A107.CAL	A1.07	FLOOR PLAN- AREA G
FP22A108.CAL	A1.08	FLOOR PLAN- AREA H & J
FP22A112.CAL	A1.12	ENLARGED FLOOR PLANS
FP22A120.CAL	A1.20	FLOOR PLAN DETAILS
FP22A130.CAL	A1.30	UPPER LEVEL - AREA A
FP22A131.CAL	A1.31	UPPER LEVEL - AREA B
FP22A204.CAL	A2.04	REFLECTED CEILING PLAN AREAS H & J
FP22A401.CAL	A4.01	EXTERIOR ELEVATIONS
FP22A403.CAL	A4.03	WEST ELEVATION
FP22A404.CAL	A4.04	SOUTH ELEVATION
FP22A405.CAL	A4.05	NORTH ELEVATION
FP22A411.CAL	A4.11	INTERIOR ELEVATIONS
FP22A412.CAL	A4.12	INTERIOR ELEVATIONS
FP22A501.CAL	A5.01	BUILDING SECTIONS
FP22A502.CAL	A5.02	BUILDING SECTIONS
FP22A510.CAL	A5.10	WALL SECTIONS
FP22A511.CAL	A5.11	WALL SECTIONS
FP22A512.CAL	A5.12	WALL SECTIONS
FP22A513.CAL	A5.13	WALL SECTIONS
FP22A514.CAL	A5.14	WALL SECTIONS
FP22A520.CAL	A5.20	INTERIOR WALL TYPES
FP22A521.CAL	A5.21	INTERIOR & EXTERIOR WALL TYPES
FP22A602.CAL	A6.02	DOOR SCHEDULE
FP22A603.CAL	A6.03	WINDOW SCHEDULE
FP22A604.CAL	A6.04	LOUVER SCHEDULE
FP22A701.CAL	A7.01	DOOR DETAILS
FP22A702.CAL	A7.02	DOOR DETAILS
FP22A703.CAL	A7.03	DOOR DETAILS
FP22A704.CAL	A7.04	DOOR DETAILS
FP22A705.CAL	A7.05	DOOR & LOUVER DETAILS
FP22A706.CAL	A7.06	DOOR & WINDOW DETAILS
FP22A707.CAL	A7.07	WINDOW & LOUVER DETAILS
FP22A801.CAL	A8.01	ROOF DETAILS
FP22A802.CAL	A8.02	ROOF DETAILS
FP22A904.CAL	A9.04	CABINET & MISCELLANEOUS DETAILS
FP22A905.CAL	A9.05	CEILING DETAILS
FP22A906.CAL	A9.06	MISCELLANEOUS DETAILS

FP22A911.CAL	A9.11	WALL DETAILS
FP22A912.CAL	A9.12	WALL DETAILS
FP22FP1.CAL	FP.1	FIRE PROTECTION PLAN
FP22S105.CAL	S1.05	FOUNDATION PLAN - AREA E
FP22S107.CAL	S1.07	FOUNDATION PLAN - AREA G
FP22S200.CAL	S2.00	COMPOSITE ROOF FRAMING PLAN
FP22S205.CAL	S2.05	ROOF FRAMING PLAN - AREA E
FP22S206.CAL	S2.06	ROOF FRAMING PLAN - AREA F
FP22S207.CAL	S2.07	ROOF FRAMING PLAN - AREA G
FP22S208.CAL	S2.08	MEZZANINE FRAMING PLANS - AREAS H & J
FP22S209.CAL	S2.09	ROOF FRAMING PLAN - AREA K
FP22S402.CAL	S4.02	FOUNDATION SECTIONS AND DETAILS
FP22S403.CAL	S4.03	FOUNDATION SECTIONS AND DETAILS
FP22S404.CAL	S4.04	FOUNDATION SECTIONS AND DETAILS
FP22S405.CAL	S4.05	FOUNDATION SECTIONS AND DETAILS
FP22S408.CAL	S4.08	FOUNDATION SECTIONS AND DETAILS
FP22S501.CAL	S5.01	FRAMING ELEVATIONS-LINES 1, 2, & 2.1
FP22S502.CAL	S5.02	FRAMING ELEVATIONS-LINES 2.2, 2.3 2.4 & 2.5
FP22S503.CAL	S5.03	FRAMING ELEVATIONS-LINES 3,4,4.1,4.2,4.4,6,6.1 & 7
FP22S504.CAL	S5.04	FRAMING ELEVATIONS - LINES 4.5, 5, 7.2, 8, 8.5 & 9
FP22S505.CAL	S5.05	FRAMING ELEVATIONS - LINES 10, 10.1, A, B & B.2
FP22S506.CAL	S5.06	FRAMING ELEVATIONS - LINES B.5 & C
FP22S507.CAL	S5.07	FRAMING ELEVATIONS - LINES C.1, C.2, C.4 & D
FP22S508.CAL	S5.08	FRAMING ELEVATIONS - LINES E, F, F.1 & H
FP22S509.CAL	S5.09	FRAMING ELEVATIONS - LINES H.1, J & K
FP22S510.CAL	S5.10	FRAMING ELEVATIONS - LINES K.1, K.2&L.1 THRU L.17
FP22S607.CAL	S6.07	FRAMING SECTIONS AND DETAILS
FP22S608.CAL	S6.08	FRAMING SECTIONS AND DETAILS
FP22S701.CAL	S7.01	TYPICAL CONCRETE MASONRY DETAILS
FP22S804.CAL	S8.04	REARING PONDS AND BROOD PONDS - CHIMNEYS
FP22E202.CAL	E2.02	POWER AND SIGNAL FLOOR PLAN - AREA B
FP22E203.CAL	E2.03	POWER AND SIGNAL FLOOR PLAN - AREA C
FP22E204.CAL	E2.04	POWER AND SIGNAL FLOOR PLAN - AREA D
FP22E206.CAL	E2.06	POWER AND SIGNAL FLOOR PLAN - AREA F
FP22E501.CAL	E5.01	POWER ONE-LINE DIAGRAM - SCHEDULES AND DETAILS

2. This amendment is a part of the bidding papers and its receipt shall be acknowledged on the Standard Form 1442. All other conditions and requirements of the specifications remain unchanged. If the bids have been mailed prior to receiving this amendment, you will notify the office where bids are opened, in the specified manner, immediately of its receipt and of any changes in your bid occasioned thereby.

a. Hand-Carried Bids shall be delivered to the U.S. Army Corps of Engineers, Omaha District, Contracting Division (Room 301), 106 South 15th Street, Omaha, Nebraska 68102-1618.

b. Mailed Bids shall be addressed as noted in Item 8 on Page 00010-1 of Standard Form 1442.

3. Bids will be received until 2:00 p.m., local time at place of bid opening, 30 May 2002.

Attachments:
Standard Form 1442 Pages 00010-3 and 00010-4
Spec Pages listed in 1.b. above
Detail listed in 1.c. above

Dwgs. listed in 1.d. above

U.S. Army Engineer District, Omaha
Corps of Engineers
106 South 15th Street
Omaha, Nebraska 68102-1618

16 May 2003
MFS/4411

BIDDING SCHEDULE

Item No.	Description	Estimated Quantity	Unit	Unit Price	Amount
	BASIC				
1.	Entire work complete excluding item 2.and options below.	Job	L.S.	xxx	$_____
2.	Electronic Equipment as shown on the Drawings and in the Specs	Job	L.S.	xxx	$5,000
	OPTIONS				
O-1	All work complete for Rearing Pond Liners 31 thru 40 as show on Sheet U1.06	Job	L.S.	xxx	$_____
O-2	All work complete for the Roof Canopy and Raceway As shown on Sheet AC.02	Job	L.S.	xxx	$_____
O-3	All work complete for the Landscaping as shown on the drawings and in the Specs	Job	L.S.	xxx	$_____
O-4	All work complete for providing and installation of additional crushed rock for the west equipment area, as shown on the drawings and in the specs	650	Tons	$_____	$_____

TOTAL AMOUNT (BASIC + OPTIONS) $_____
(in figures)

Notes:

1. See SECTION 00100, INSTRUCTIONS, CONDITIONS, & NOTICES TO BIDDERS for evaluation of options. The Government reserves the right to exercise the options at time of award.

2. Bid prices must be entered for all items of the schedule. Total amount bids submitted without bid prices being entered on individual items will be rejected. Additions will be subject to verification by the Government. In case of variation between the lump-sum prices and the total amount, the lump-sum prices will be considered the bid.

3. A modification to a bid which provides for a single adjustment to the total amount bid, should state the application of the adjustment to each respective lump-sum price affected. If the modification is not so apportioned, the single adjustment will be applied to Item No. 1.

4. For Electronic Equipment see Section 00800 Paragraph 1.1.2 and Section 10100A.

SECTION TABLE OF CONTENTS

DIVISION 02 - SITE WORK

SECTION 02370A

GEOMEMBRANE FOR PONDS

10/01

SECTION 02370A

GEOMEMBRANE FOR PONDS
10/01

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of the specification to the extent referenced. The publications are referenced in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 638	(1999) Tensile Properties of Plastics
ASTM D 1004	(1994a) Initial Tear Resistance of Plastic Film and Sheeting
ASTM D 1505	(1998) Density of Plastics by the Density-Gradient Technique
ASTM D 1603	(1994) Carbon Black in Olefin Plastics
ASTM D 3895	(1998) Method for Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry
ASTM D 4218	(1996) Test Method for Determination of Carbon Black Content in Polyethylene Compounds By the Muffle-Furnace Technique
ASTM D 4833	(2000) Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products
ASTM D 5199	(1999) Measuring Nominal Thickness of Geotextiles and Geomembranes
ASTM D 5397	(1995) Evaluation of Stress Crack Resistance of Polyolefin Geomembranes Using Notched Constant Tensile Load Test
ASTM D 5596	(1994) Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics
ASTM D 5721	(1995) Air-Oven Aging of Polyolefin Geomembranes
ASTM D 5885	(1997) Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry
ASTM D 6392	(1999) Determining the Integrity of

	Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods
ASTM D 6497	(2000) Mechanical Attachment of Geomembrane to Penetrations or Structures

GEOSYNTHETIC INSTITUTE (GSI)

GSI GRI GM-9	(1995) Cold Weather Seaming of Geomembranes
GSI GRI GM-11	(1997) Accelerated Weathering of Geomembrane Using a Fluorescent UVA Device

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Layout and Detail Drawings; G-DO

Geomembrane panel layout and penetration detail drawings, a minimum of 7 days prior to geomembrane placement. Also include proposed method and location for attaching geomembrane to concrete chimney structures.

As-Built Drawings; G-AO

Final as-built drawings of geomembrane installation

SD-03 Product Data

Tests, Inspections, and Verifications; G-AO

Manufacturer's QC manuals, a minimum of 7 days prior to geomembrane shipment.

Field Seaming; G-AO

Installer's QC manual, a minimum of 7 days prior to geomembrane placement.

Qualifications; G-AO

Manufacturer's qualification statements, including resumes of key personnel involved in the project, a minimum of 7 days prior to geomembrane shipment.

Installer's, QC inspector's, and QC laboratory's qualification statements including resumes of key personnel involved in the project a minimum of 7 days prior to geomembrane placement. The submittal from the QC laboratory shall include verification that the laboratory is accredited via the Geosynthetic Accreditation Institute's Laboratory Accreditation Program (GAI-LAP) for the

tests the QC laboratory will be required to perform.

SD-04 Samples

Samples; G-AO

Geomembrane QA and QC samples.

SD-06 Test Reports

Material; G-DO

Manufacturer's certified raw and sheet material test reports and a copy of the QC certificates, a minimum of 7 days prior to shipment of geomembrane to the site.

Surface Preparation; G-AO

Certification from the QC inspector and installer of the acceptability of the surface on which the geomembrane is to be placed, immediately prior to geomembrane placement.

Non-Destructive Field Seam Continuity Testing; G-AO

QC inspector certified test results on all field seams.

Destructive Field Seam Testing; G-DO

Proposed variable destructive seam sample interval criteria, a minimum of 7 days prior to geomembrane placement.

Destructive Field Seam Testing; G-AO

Installer and certified QC laboratory test results on all destructively tested field seams.

Destructive Seam Test Repairs; G-AO

QC inspector certified test results on all repaired seams.

Tests; G-AO

Certified QC test results.

1.3 QUALIFICATIONS

1.3.1 Manufacturer

Manufacturer shall have produced the proposed geomembrane sheets for at least 5 completed projects having a total minimum area of 10 million square feet.

1.3.2 Installer

The installer is responsible for field handling, deploying, seaming, anchoring, and field Quality Control (QC) testing of the geomembrane. The installer shall have installed the proposed geomembrane material for at least 5 completed projects having a total minimum area of 2 million square feet. At least one seamer shall have experience seaming a minimum of

500,000 square feet of the proposed geomembrane using the same type of seaming equipment and geomembrane thickness specified for this project.

1.3.3 QC Inspector

The QC inspector is the person or corporation hired by the Contractor, who is responsible for monitoring and documenting activities related to the QC of the geomembrane from manufacturing through installation. The QC inspector shall have provided QC inspection during installation of the proposed geomembrane material for at least 5 completed projects having a total minimum area of 2 million square feet.

1.3.4 QC Laboratory

The QC laboratory shall have provided QC and/or Quality Assurance (QA) testing of the proposed geomembrane and geomembrane seams for at least five completed projects having a total minimum area of 2 million square feet. The QC laboratory shall be accredited via the Geosynthetic Accreditation Institute's Laboratory Accreditation Program (GAI-LAP) for the tests the QC laboratory will be required to perform.

1.4 DELIVERY, STORAGE AND HANDLING

1.4.1 Delivery

The QC inspector shall be present during delivery and unloading of the geomembrane. Each geomembrane roll/panel shall be labeled with the manufacturer's name, product identification number, roll/panel number, and roll dimensions.

1.4.2 Storage

Temporary storage at the project site shall be on a level surface, free of sharp objects where water cannot accumulate. The geomembrane shall be protected from puncture, abrasion, excessive heat or cold, material degradation, or other damaging circumstances. Storage shall not result in crushing the core of roll goods or flattening of the rolls. Rolls shall not be stored more than two high. Palleted materials shall be stored on level surfaces and shall not be stacked on top of one another. Damaged geomembrane shall be removed from the site and replaced with geomembrane that meets the specified requirements.

1.4.3 Handling

Rolls/panels shall not be dragged, lifted by one end, or dropped. A pipe or solid bar, of sufficient strength to support the full weight of a roll without significant bending, shall be used for all handling activities. The diameter of the pipe or solid bar shall be small enough to be easily inserted through the core of the roll. Chains shall be used to link the ends of the pipe or bar to the ends of a spreader bar. The spreader bar shall be wide enough to prevent the chains from rubbing against the ends of the roll. Alternatively, a stinger bar protruding from the end of a forklift or other equipment may be used. The stinger bar shall be at least three-fourths the length of the core and also must be capable of supporting the full weight of the roll without significant bending. If recommended by the manufacturer, a sling handling method utilizing appropriate loading straps may be used.

1.5 WEATHER LIMITATIONS

Geomembrane shall not be deployed or field-seamed in the presence of excess moisture (i.e., rain, fog, dew), in areas of ponded water, or in the presence of excess wind. Unless authorized by the Contracting Officer, no placement or seaming shall be attempted at geomembrane temperatures below 32 degrees F or above 104 degrees F. If seaming is allowed below 32 degrees F, the procedures outlined in GSI GRI GM-9 shall be followed. In marginal conditions, seaming shall cease unless destructive field seam tests, conducted by the QC laboratory, confirm that seam properties meet the requirements listed in Table 2. Tests shall be conducted in accordance with paragraph Destructive Field Seam Testing.

1.6 EQUIPMENT

Equipment used in performance of the work shall be in accordance with the geomembrane manufacturer's recommendations and shall be maintained in satisfactory working condition.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Raw Materials

Resin used in manufacturing geomembrane sheets shall be made of virgin uncontaminated ingredients. No more than 10 percent clean regrind, reworked, or trim material in the form of chips or edge strips shall be used to manufacture the geomembrane sheets. All regrind, reworked, or trim materials shall be from the same manufacturer and exactly the same formulation as the geomembrane sheet being produced. No post consumer materials or water-soluble ingredients shall be used to produce the geomembrane. The Contractor shall submit a copy of the test reports and QC certificates for materials used in the manufacturing of the geomembrane shipped to the site.

2.1.2 Sheet Materials

Geomembrane sheets shall be unreinforced and manufactured as wide as possible to minimize field seams. Geomembrane sheets shall be uniform in color, thickness, and surface texture. The sheets shall be free of and resistant to fungal or bacterial attack and free of cuts, abrasions, holes, blisters, contaminants and other imperfections. Geomembrane sheets shall conform to the requirements listed in Table 1 for Manufacturing Quality Control (MQC).

TABLE 1. SMOOTH HDPE GEOMEMBRANE PROPERTIES

PROPERTY	TEST VALUE	MQC TESTING FREQUENCY (MIN.)	TEST METHOD
Thickness (min ave)	40 mils	per roll	ASTM D 5199
Lowest individual	-10 percent	per roll	ASTM D 5199

TABLE 1. SMOOTH HDPE GEOMEMBRANE PROPERTIES

PROPERTY	TEST VALUE	MQC TESTING FREQUENCY (MIN.)	TEST METHOD
of 10 values			
Density (min)	0.940 g/cc	per 200,000 lb	ASTM D 1505
Tensile Properties (1) (min ave)		per 20,000 lb	ASTM D 638 Type IV
-yield stress	84 lb/in		
-break stress	152 lb/in		
-yield elong	12 percent		
-break elong	700 percent		
Tear Resistance (min ave)	28 lb	per 45,000 lb	ASTM D 1004
Puncture Resistance (min ave)	72 lb	per 45,000 lb	ASTM D 4833
Stress Crack Resistance (2)	600 hr	per 200,000 lb	ASTM D 5397 (Appendix)
Carbon Black Content	2.0-3.0 percent	per 20,000 lb	ASTM D 1603 (3)
Carbon Black Dispersion	Note (4)	per 45,000 lb	ASTM D 5596
Oxidative Induction Time (OIT) (min ave) (5)		per 200,000 lb	
-Std OIT	100 min		ASTM D 3895
or			
-High Pres OIT	400 min		ASTM D 5885
Oven Aging at 85 deg C (min ave) (5), (6)		per year and change in formulation	ASTM D 5721
-Std OIT	55 percent at 90 days		ASTM D 3895
or			
-High Pres OIT	80 percent at 90 days		ASTM D 5885
UV Resistance		per year and	GSI GRI GM-11

TABLE 1. SMOOTH HDPE GEOMEMBRANE PROPERTIES

PROPERTY	TEST VALUE	MQC TESTING FREQUENCY (MIN.)	TEST METHOD
(min ave) (7)		change in formulation	
-High Pres OIT(8)(9)	50 percent at 1600 hours		ASTM D 5885

MQC = Manufacturing Quality Control

Note (1): Minimum average machine direction and minimum average cross machine direction values shall be based on 5 test specimens in each direction. For HDPE geomembrane, yield elongation is calculated using a gauge length of 1.3 inches. For HDPE geomembrane, break elongation is calculated using a gauge length of 2.0 inches.

Note (2): For HDPE geomembrane, the yield stress used to calculate the applied load for test method ASTM D 5397 (Appendix), shall be the manufacturer's mean value.

Note (3): Other methods such as ASTM D 4218 or microwave methods are acceptable if an appropriate correlation to ASTM D 1603 can be established.

Note (4): Carbon black dispersion for 10 different views:
- all 10 in Category 1

Note (5): The manufacturer has the option to select either one of the OIT methods to evaluate the antioxidant content.

Note (6): Evaluate samples at 30 and 60 days and compare with the 90 day response.

Note (7): The condition of the test shall be a 20 hour UV cycle at 167 degrees F followed by a 4 hour condensation cycle at 140 degrees F.

Note (8): The standard OIT test (ASTM D3895) shall not be used in determining UV resistance.

Note (9): UV resistance is based on percent retained value regardless of the original HP-OIT value.

TABLE 2. HDPE SEAM PROPERTIES

PROPERTY	TEST VALUE	TEST METHOD
Seam Shear Strength (min) (1)	80 lb/in	ASTM D 6392

TABLE 2. HDPE SEAM PROPERTIES

PROPERTY		TEST VALUE	TEST METHOD
Seam Peel Strength (min) (1) (2)	Hot Wedge	60 lb/in	ASTM D 6392
	Extrusion	52 lb/in	

Note (1): Failure in both peel and shear tests should occur outside the seam, in the adjacent geomembrane.

Note (2): Where applicable, each track of a double hot wedge seam shall be individually tested for peel adhesion.

2.2 TESTS, INSPECTIONS, AND VERIFICATIONS

2.2.1 Manufacturing, Sampling, and Testing

2.2.1.1 Raw Materials

Raw materials shall be tested in accordance with the approved MQC manual. Any raw material which fails to meet the geomembrane manufacturer's specified physical properties shall not be used in manufacturing the sheet. Seaming rods and pellets shall be manufactured of materials which are essentially identical to that used in the geomembrane sheet. Seaming rods and pellets shall be tested for density, melt index and carbon black content in accordance with the approved MQC manual. Seaming rods and pellets which fail to meet the corresponding property values required for the sheet material, shall not be used for seaming.

2.2.1.2 Sheet Material

Geomembrane sheets shall be tested in accordance with the approved MQC manual. As a minimum, MQC testing shall be conducted at the frequencies shown in Table 1. Sheets not meeting the minimum requirements specified in Table 1 shall not be sent to the site.

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Surface Preparation

Surface preparation shall be performed in accordance with Section 02300A. Rocks larger than 1/2 inch in diameter and any other material which could damage the geomembrane shall be removed from the surface to be covered with the geomembrane. Construction equipment tire or track deformations beneath the geomembrane shall not be greater than 1.0 inch in depth. Each day during placement of geomembrane, the QC Inspector and installer shall inspect the surface on which geomembrane is to be placed and certify in writing that the surface is acceptable. Repairs to the subgrade shall be performed at no additional cost to the Government.

3.1.2 Anchor Trenches

Where an anchor trench is required, it shall be placed 24 inches back from

the edge of the slope to be covered. The anchor trench shall be 24 inches deep and 18 inches wide. If the anchor trench is excavated in cohesive soil susceptible to desiccation, only the amount of anchor trench required for placement of geomembrane in a single day shall be excavated. Ponded water shall be removed from the anchor trench while the trench is open. Trench corners shall be slightly rounded to avoid sharp bends in the geomembrane. All loose soil and rock shall be removed from the anchor trench. The geomembrane shall extend down the front wall and across the bottom of the anchor trench. The geomembrane shall not be folded in the anchor trench and all seams shall be welded right through to the edge. Any sample holes in the trench liner shall be repaired. Backfilling and compaction of the anchor trench shall be in accordance with Section 02300A.

3.2 GEOMEMBRANE DEPLOYMENT

The procedures and equipment used shall not induce stress, wrinkle, scratch, or otherwise damage the geomembrane or the underlying subgrade. Geomembrane shall be unrolled downslope in a controlled manner with sufficient overlap for shear and peel testing. Geomembrane damaged during installation shall be replaced or repaired, at the QC inspector's discretion. Only geomembrane panels that can be anchored and seamed together the same day shall be deployed. Adequate ballast (i.e., sand bags) shall be placed on the geomembrane, without damaging the geomembrane, to prevent uplift by wind. No equipment shall be operated on the top surface of the geomembrane without permission from the Contracting Officer. Seams shall be oriented parallel to the line of maximum slope. Where seams can only be oriented across the slope, the upper panel shall be lapped over the lower panel.

3.2.1 Wrinkles

The methods used to deploy and backfill over the geomembrane shall minimize wrinkles and tensile stresses in the geomembrane. The geomembrane shall have adequate slack to prevent the creation of tensile stress. The wrinkle height to width ratio for installed geomembrane shall not exceed 0.5. In addition, geomembrane wrinkles shall not exceed 6 inches in height. Wrinkles that do not meet the above criteria shall be cut out and repaired in accordance with the installer's approved QC manual.

3.3 FIELD SEAMING

3.3.1 Trial Seams

Trial seams shall be made under field conditions using strips of excess geomembrane. Trial seams shall be made each day prior to production seaming, whenever there is a change in seaming personnel or seaming equipment and at least once every four hours, by each seamer and each piece of seaming equipment used that day. Trial seam samples shall be collected and tested in accordance with ASTM D 6392. One sample shall be obtained from each trial seam. This sample shall be at least 36 inches long by 12 inches wide with the seam centered lengthwise. Four random specimens 1 inch wide shall be cut from the sample. Two seam specimens shall be field tested for shear strength and two seam specimens shall be field tested for peel adhesion using an approved quantitative tensiometer. To be acceptable, all replicate test specimens shall meet seam strength requirements specified in Table 2. If the field tests fail to meet these requirements, the entire operation shall be repeated. If the additional trial seam fails, the seaming apparatus or seamer shall not be used until the deficiencies are corrected by the installer and 2 consecutive

successful trial seams are achieved.

3.3.2 Field Seams

Panels shall be seamed in accordance with the geomembrane manufacturer's recommendations. In sumps, corners and odd-shaped geometric locations, the number of field seams shall be minimized. Seaming shall extend to the outside edge of panels. Soft subgrades shall be compacted and approved prior to seaming. The seam area shall be free of moisture, dust, dirt, and foreign material at the time of seaming. Fish mouths in seams shall be repaired. Spot tack welding shall be avoided, particularly in cold weather. When necessary, spot tack welding shall be performed using procedures that do not damage the geomembrane.

3.3.2.1 Polyethylene Seams

Polyethylene geomembranes shall be seamed by thermal fusion methods. Extrusion welding shall only be used for patching and seaming in locations where thermal fusion methods are not feasible. Seam overlaps that are to be attached using extrusion welds shall be ground prior to welding. Grinding marks shall be oriented perpendicular to the seam direction and no marks shall extend beyond the extrudate after placement. Extrusion welding shall begin within 10 minutes after grinding. Where extrusion welds are temporarily terminated long enough to cool, they shall be ground prior to applying new extrudate over the existing seam. The total depth of the grinding marks shall be no greater than 10 percent of the sheet thickness.

3.4 SAMPLES

One QC sample, 18 inches in length, for the entire width of a roll, shall be obtained for every 100,000 square feet of material delivered to the site. Samples shall not be obtained from the first three feet of the roll. The samples shall be identified by manufacturer's name, product identification, lot and roll/panel number. The date, a unique sample number, and the machine direction shall also be noted. In addition, a 12 inch by 12 inch QA sample shall be collected, labeled, and submitted to the Contracting Officer each time QC samples are collected.

3.5 TESTS

The Contractor shall provide all QC samples to the QC laboratory to determine density, thickness, tensile strength at break, and elongation at break in accordance with the methods specified in Table 1. Samples not meeting the specified requirements shall result in the rejection of applicable rolls/panels. As a minimum, rolls/panels produced immediately prior to and immediately after the failed roll/panel shall be tested for the same failed parameter. Testing shall continue until a minimum of three successive rolls/panels on both sides of the original failing roll/panel pass the failed parameter.

3.5.1 Non-Destructive Field Seam Continuity Testing

Field seams shall be non-destructively tested for continuity over their full length in accordance with the installer's approved QC manual. Seam testing shall be performed as the seaming work progresses, not at the completion of field seaming. Any seams which fail shall be documented and repaired in accordance with the installer's approved QC manual.

3.5.2 Destructive Field Seam Testing

A minimum of one destructive test sample per 500 feet of field seam shall be obtained at locations specified by the QC inspector and approved by the Contracting Officer. The destructive test sample interval may be varied by incorporating procedures outlined in GRI GM-14. Sample locations shall not be identified prior to seaming. Samples shall be a minimum of 12 inches wide by 42 inches long with the seam centered lengthwise. Each sample shall be cut into 3 equal pieces, with one piece retained by the installer, one piece given to the QC laboratory, and the remaining piece given to the Contracting Officer for QA testing and/or permanent record. Each sample shall be numbered and cross referenced to a field log which identifies: (1) panel number; (2) seam number; (3) date and time cut; (4) geomembrane temperature; (5) seaming unit designation; (6) name of seamer; and (7) seaming apparatus temperature and pressures (where applicable). Ten 1 inch wide replicate specimens shall be cut from the installer's sample. Five specimens shall be tested for shear strength and 5 for peel adhesion using an approved field quantitative tensiometer. Jaw separation speed shall be in accordance with the approved QC manual. To be acceptable, all replicate test specimens shall meet the seam strength requirements specified in Table 2. If the field tests pass, 5 specimens shall be tested at the QC laboratory for shear strength and 5 for peel adhesion in accordance with the QC laboratory's approved procedures. To be acceptable, all replicate test specimens shall meet the seam strength requirements specified in Table 2. If the field or laboratory tests fail, the seam shall be repaired in accordance with paragraph Destructive Seam Test Repairs. Holes for destructive seam samples shall be repaired the same day they are cut.

3.6 DEFECTS AND REPAIRS

3.6.1 Destructive Seam Test Repairs

Seams that fail destructive seam testing may be overlaid with a strip of new material and seamed (cap stripped). Alternatively, the seaming path shall be retraced to an intermediate location a minimum of 10 feet on each side of the failed seam location. At each location a 12 by 18 inch minimum size seam sample shall be taken for 2 additional shear strength and 2 additional peel adhesion tests using an approved quantitative field tensiometer. If these tests pass, then the remaining seam sample portion shall be sent to the QC laboratory for 5 shear strength and 5 peel adhesion tests in accordance with the QC laboratory's approved procedures. To be acceptable, all replicate test specimens must meet specified seam strength requirements. If these laboratory tests pass, then the seam shall be cap stripped or repaired using other approved methods between that location and the original failed location. If field or laboratory tests fail, the process shall be repeated. After repairs are completed, the repaired seam shall be non-destructively tested in accordance with paragraph Non-Destructive Field Seam Continuity Testing.

3.6.2 Patches

Tears, holes, blisters and other defects shall be repaired with patches. Patches shall have rounded corners, be made of the same geomembrane, and extend a minimum of 6 inches beyond the edge of defects. Minor localized flaws shall be repaired by spot welding or seaming as determined by the QC inspector. No more than two beads shall be performed to repair any one location. Repairs shall be non-destructively tested. The Contracting Officer or the QC inspector may also elect to perform destructive seam tests on suspect areas.

3.7 VISUAL INSPECTION AND EVALUATION

Immediately prior to covering, the geomembrane, seams, and non-seam areas shall be visually inspected by the QC inspector and Contracting Officer for defects, holes, or damage due to weather conditions or construction activities. At the Contracting Officer's or the QC inspector's discretion, the surface of the geomembrane shall be brushed, blown, or washed by the installer if the amount of dust, mud, or foreign material inhibits inspection. Each suspect location shall be non-destructively tested in accordance with paragraph Non-Destructive Field Seam Continuity Testing. Each location that fails non-destructive testing shall be repaired in accordance with paragraph Patches and non-destructively retested.

3.8 PENETRATIONS

Geomembrane penetration details shall be in accordance with ASTM D 6497 or as recommended by the geomembrane manufacturer. Factory fabricated boots shall be used wherever possible. Field seams for penetrations shall be non-destructively tested in accordance with the installer's approved QC manual. Seams that fail non-destructive testing shall be repaired in accordance with the installer's approved QC manual and non-destructively tested prior to acceptance.

3.9 PROTECTION AND BACKFILLING

The anchor trench of the deployed and seamed geomembrane shall be covered with the specified material within 14 calendar days of acceptance. Wrinkles in the geomembrane shall be prevented from folding over during placement of cover materials. Cover material shall not be dropped onto the geomembrane or overlying geosynthetics from a height greater than 3 feet. The cover material shall be pushed out over the geomembrane or overlying geosynthetics in an tumbling motion. The initial loose soil lift thickness shall be 6 inches. Equipment with ground pressures less than 7 psi shall be used to place the first lift over the geomembrane. Cover material compaction and testing requirements are described in Section 02300A. Equipment placing cover material shall not stop abruptly, make sharp turns, spin their wheels, or travel at speeds exceeding 5 mph.

3.10 AS-BUILT DRAWINGS

Final as-built drawings of the geomembrane installation shall be prepared. These drawings shall include panel numbers, roll numbers, seam numbers, location of repairs, types of repairs, destructive seam samples and numbers, and penetrations.

-- End of Section --

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DIVISION 13 - SPECIAL CONSTRUCTION

SECTION 13120

INSULATED METAL WALL PANELS AND MISCELLANEOUS COMPONENTS

09/98; Omaha Update 3/99

SECTION 13120

INSULATED METAL WALL PANELS AND MISCELLANEOUS COMPONENTS
09/98; Omaha Update 3/99

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ALUMINUM ASSOCIATION (AA)

AA-01	(1997) Aluminum Standards and Data
AA-02	(1994) Aluminum Design Manual: Specification & Guidelines for Aluminum Structures

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC-04	(1989) Specification for Structural Steel Buildings - Allowable Stress Design, Plastic Design
AISC Pub No. S342 L	(1993) Load and Resistance Factor Design Specification for Structural Steel Buildings

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI-01	(1996) Cold-Formed Steel Design Manual

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 463/A 463M	(1996a) Steel Sheet, Aluminum-Coated by the Hot-Dip Process
ASTM A 653/A 653M	(1997) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 792/A 792M	(1997) Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
ASTM B 117	(1997) Operating Salt Spray (Fog) Apparatus
ASTM B 209	(1996) Aluminum and Aluminum-Alloy Sheet and Plate
ASTM D 522	(1993a) Mandrel Bend Test of Attached Organic Coatings
ASTM D 714	(1987; R 1994) Evaluating Degree of Blistering of Paints

ASTM D 968	(1993) Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D 1308	(1987; R 1993) Effect of Household Chemicals on Clear and Pigmented Organic Finishes
ASTM D 1654	(1992) Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
ASTM D 2244	(1993) Calculation of Color Differences from Instrumentally Measured Color Coordinates
ASTM D 2247	(1994) Testing Water Resistance of Coatings in 100 % Relative Humidity
ASTM D 2794	(1993) Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
ASTM D 3359	(1995a) Measuring Adhesion by Tape Test
ASTM D 4214	(1997) Evaluating the Degree of Chalking of Exterior Paint Films
ASTM D 4587	s(1991) Conducting Tests on Paint and Related Coatings and Materials Using a Fluorescent UV-Condensation Light - and Water-Exposure Apparatus
ASTM E 84	(1996a) Surface Burning Characteristics of Building Materials

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7	(1995) Minimum Design Loads for Buildings and Other Structures

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1	(1996) Structural Welding Code - Steel

SHEET METAL & AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

SMACNA-02	(1993; Errata) Architectural Sheet Metal Manual

1.2 GENERAL REQUIREMENTS

The insulated metal wall panels covered under this specification shall be provided by a single manufacturer. Structural Standing Seam Metal Roofing System is specified in SECTION: 07416 Structural Standing Seam Metal Roof (SSMR) System.

1.2.1 Insulated Metal Wall Panels and Miscellaneous Components

This specification SECTION 13120 covers the insulated metal wall panels and a variety of miscellaneous exterior building components for this project. These items shall be shall be as shown on the drawings. The following items are specified within this section- insulated metal wall panels, gutters, downspouts, louvers, soffit panels, fascia, and trim.

1.2.2 Qualifications

1.2.2.1 Manufacturer

The manufacturer of insulated metal wall panel and miscellaneous building components specified herein shall have been in the practice of manufacturing these items for a period of not less than 5 years. The manufacturer shall be chiefly engaged in the practice of designing and fabricating. It is not necessary to have one manufacturer responsible for the fabrication for all of these items.

1.2.2.2 Installer

Installers shall have specialized experience in the erection of the specified itemsfor a period of at least 3 years.

1.3 DESIGN REQUIREMENTS

Criteria, loading combinations, and definitions shall be in accordance with ASCE 7.

1.3.1 Framing and Structural Members

Connections shall be designed in accordance with AISC-04 or AISC Pub No. S342 L. Structural cold-formed steel framing members and their connections shall be designed in accordance with AISI-01. Aluminum structural members and their connections shall be designed in accordance with AA-02. Maximum deflection under applied live load, snow, or wind load shall not exceed 1/180th of the span length. Members with openings in their webs shall be designed with consideration of the additional stresses which will result due to the openings.

1.3.2 Insulated Metal Wall Panels - Siding

Except as otherwise specified, steel siding shall be designed in accordance with AISI-01. Aluminum siding shall be designed in accordance with AA-01. Section modulus and moment of inertia of aluminum sheet shall be determined for actual cross section dimensions by the conventional methods for actual design stresses and by effective width concept for deflection in accordance with AA-02. Maximum deflection for wall panels under applied live load, snow or wind loads shall not exceed 1/180th of the span length. Maximum deflections shall be based on sheets continuous across two or more supports with sheets unfastened and fully free to deflect. The calculated deflection from the concentrated load shall not exceed 1/180 of the span length.

1.3.3 Provisions for Gutters And Downspouts

Gutters and downspouts shall be designed according to the requirements of SMACNA-02 for storms which should be exceeded only once in 5 years and with adequate provisions for thermal expansion and contraction. Supports for gutters and downspouts shall be designed for the anticipated loads. Roof drainage system to withstand rainfall intensity of 4 inches per hour, with

5 minute duration.

1.3.4 Provisions for Louvers

Louvers shall be fixed-blade type designed for a minimum net open area as shown on the drawings, to be rainproof, and to resist vibration when air is passed at the rate of 1500 cubic feet per minute.

1.4 DESIGN ANALYSIS

The design analysis shall be the design of a licensed Professional Engineer experienced in design of this work and shall include complete calculations for the building, its components, and the foundations. Formulas and references shall be identified. Wind forces on various parts of the structure, both positive and negative pressure, shall be calculated with the controlling pressure summarized. Computer programmed designs shall be accompanied by stress values and a letter of certification, signed by a licensed Professional Engineer, stating the design criteria and procedures used and attesting to the adequacy and accuracy of the design. A narrative of the computer program delineating the basic methodology shall be included. Computer program output shall be annotated and supplemented with sketches to verify the input and output. Critical load conditions used in the final sizing of the members shall be emphasized. The design analysis shall include the name and office phone number of the designer, who shall function as a point of contact to answer questions during the detail drawing review.

1.5 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Metal Systems; G-DO

Insulated metal wall panels, gutters, downspouts, louvers, soffit panels, fascia and trim

Detail drawings consisting of catalog cuts, design and installation drawings. Shop painting and finishing specifications.

SD-04 Samples

Accessories; G-DO

One sample of each type of flashing, trim, closure, cap and similar items. Size shall be sufficient to show construction and configuration.

Siding; G-DO

One piece of each type and finish (exterior and interior) to be used, 9 inches long, full width. The sample for factory color finished covering shall be accompanied by certified laboratory test reports showing that the sheets to be furnished are produced under a continuing quality control program and that a representative sample consisting of not less than 5 pieces has been tested and has met the quality standards specified for

factory color finish.

Fasteners; G-DO

Two samples of each type to be used, with statement regarding intended use. If so requested, random samples of bolts, nuts, and washers as delivered to the job site shall be taken in the presence of the Contracting Officer and provided to the Contracting Officer for testing to establish compliance with specified requirements.

Insulation; G-DO

One piece of each type to be used, and descriptive data covering installation.

SD-05 Design Data

Design Analysis; G-DO

Design analysis(Insulated metal wall panels and connections) as one package with the drawings.

Instruction Manuals; G-DO

Manufacturer's literature for individual building component systems.

SD-07 Certificates

Insulated Metal Wall Panel Systems;

a. Warranty certificate. At the completion of the project the Contractor shall furnish signed copies of the 5-year Warranty for Metal Wall Panel System, a sample copy of which is attached to this section, the 20-year Manufacturer's Material Warranties, and the Manufacturer's 20-year System Weathertightness Warranty when one is required.

Insulation;

Certificate attesting that the polyisocyanurate insulation furnished for the project contains recovered material, and showing an estimated percent of such recovered material.

1.6 DELIVERY AND STORAGE

Materials shall be delivered to the site in a dry and undamaged condition and stored out of contact with the ground. Materials shall be covered with weathertight coverings and kept dry. Storage accommodations for siding shall provide good air circulation and protection from surface staining.

1.7 WARRANTIES

The systems specified within this section, (composed of siding, gutters and downspouts, accessories, fasteners, trim, and miscellaneous building closure items) shall be warranted as described below against material and workmanship deficiencies, system deterioration caused by exposure to the elements and service design loads, leaks and wind damage. Any emergency temporary repairs conducted by the owner shall not negate the warranties.

1.7.1 Prime Contractor's Weathertightness Warranty

The systems shall be warranted by the Contractor on a no penal sum basis for a period of five years against materials and workmanship deficiencies; system deterioration caused by exposure to the elements and/or inadequate resistance to specified service design loads, water leaks, and wind uplift damage. The system covered under this warranty shall include but is not limited to the following: siding panels and seams, exterior gutters and downspouts, accessories, fasteners, trim, flashings and miscellaneous building closure items, connectors, components, and fasteners, and other system components and assemblies installed to provide a weathertight system; and items specified in other sections of these specifications that become part of the metal building system. All metal trim and flashing items specified in this section, which are directly related to the weathertightness of the SSSMR, shall be required to comply with the warranty requirements as specified in SECTION: 07416A STRUCTURAL STANDING SEAM METAL ROOF (SSSMR) SYSTEM. All material and workmanship deficiencies, system deterioration caused by exposure to the elements and/or inadequate resistance to specified service design loads, water leaks and wind damage shall be repaired as approved by the Contracting Officer. See the attached Contractor's written warranty for issue resolution of warrantable defects. This warranty shall warrant and cover the entire cost of repair or replacement, including all material, labor, and related markups. The Contractor shall supplement this warranty with written warranties from the installer and/or system manufacturer, which shall be submitted along with Contractor's warranty. However, the Contractor is ultimately responsible for this warranty. The Contractor's written warranty shall be as outlined in attached **WARRANTY FOR SYSTEMS,** and start upon final acceptance of the facility. The Contractor shall provide a separate bond in an amount equal to the installed total metal building system cost in favor of the owner (Government) covering the Contractor's warranty responsibilities effective throughout the five year Contractor's warranty period for the entire metal building systems as outlined above.

1.7.2 Manufacturer's Material and/or System Weathertightness Warranties

The Contractor shall furnish, in writing, the following manufacturer's material warranties to the Contracting Officer which cover all system components:

a. A manufacturer's 20 year material warranty warranting that the specified aluminum, zinc-coated steel, aluminum-zinc alloy coated steel or aluminum-coated steel will not rupture, structurally fail, fracture, deteriorate, or become perforated under normal design atmospheric conditions and service design loads. Liability under this warranty shall be limited exclusively to the cost of either repairing or replacing nonconforming, ruptured, perforated, or structurally failed securement system including fasteners and coil material.

b. A manufacturer's 20 year exterior material finish warranty on the factory colored finish warranting that the finish, under normal atmospheric conditions at the site, will not crack, peel, or delaminate; chalk in excess of a numerical rating of eight, as determined by ASTM D 4214 test procedures; or change colors in excess of five CIE or Hunter Lab color difference (delta E) units in accordance with ASTM D 2244. Liability under this warranty is exclusively limited to replacing the defective coated material.

1.8 COORDINATION MEETING

A coordination meeting shall be held within 45 days after contract award for mutual understanding of the metal building system contract requirements. This meeting shall take place at the building site and shall include representatives from the Contractor, the roofing building siding system manufacturer, the roofing building supplier, the erector, the designer, and the Contracting Officer. All items required by paragraph SUBMITTALS shall be discussed, including applicable standard manufacturer shop drawings, and the approval process. The Contractor shall coordinate time and arrangements for the meeting.

PART 2 PRODUCTS

2.1 BUILDING COMPONENTS

Each piece or part of the assembly shall be clearly and legibly marked to correspond with the drawings.

2.2 SIDING

Siding shall be either steel or aluminum and shall have a factory color finish.

2.2.1 Siding

Metal panels shall be a polyurethane foam core sandwich panel. Panel composition shall consist of a minimum 24 gauge exterior panel with a stuco embossed (Azteco) finish, a 3 inch foamed-in-place polyurethane insulation core, and a minimum 26 gauge interior flat finish panel. Length of panel sheets shall be sufficient to cover the entire height of any unbroken height of wall surface unless otherwise approved. Width of panel sheets with interlocking ribs shall provide not less than 12 inches of coverage in place. Provisions shall be made for thermal expansion and contraction consistent with the type of panel system to be used. Vertical panel reveals shall be an intergal part of the panel with an interlocking tongue and groove connection with concealed fastening. Panel joints have a dry joint appearance, which allows for thermal expansion, and prevents air and moisture transfer from the exterior to the interior of the facility. Typical panel joint details are provided on the the drawings.

Siding shall have concealed interlocking ribs for securing adjacent sheets. Exterior siding shall be fastened to framework using concealed fasteners. Interior siding shall be fastened to the framework girts using standard concealed and exposed fasteners as recommended by the panel manufacturer. Manufacturer's standard metal trim shall be provided at all convex and concave corner edges. Siding trim shall be an integral part of the siding with concealed fasteners and hemmed edges.

2.2.2 Steel Panels

Siding shall be zinc-coated steel conforming to ASTM A 653/A 653M, G 90 coating designation; aluminum-zinc alloy coated steel conforming to ASTM A 792/A 792M, AZ 50 coating; or aluminum-coated steel conforming to ASTM A 463/A 463M, Type 2, coating designation T2 E5. Panels shall be 0.024 inch thick minimum.

2.2.3 Aluminum Panels

Siding shall be aluminum alloy conforming to ASTM B 209, temper as required for the forming operation, minimum 0.032 inch thick.

2.2.4 Factory Insulated Panels

Insulated wall panels shall be factory-fabricated units with insulating core between metal face sheets, securely fastened together and uniformly separated with rigid spacers, facing of steel or aluminum of composition and gauge specified for covering, constructed in a manner that will eliminate condensation on interior of panel. Panels shall have a factory color finish. Insulation shall be compatible with adjoining materials; non running and non settling; capable of retaining its R-value for the life of the metal facing sheets; and unaffected by extremes of temperature and humidity. Panels shall provide a minimum R-value of 25 for the 3 inch thick panels and a minimum R-value of 17 for the 2 inch thick panel when tested in accordance with ASTM C 236. The assembly shall have a flame spread rating not higher than 25, and smoke developed rating not higher than 450 when tested in accordance with ASTM E 84. The insulation shall remain odorless, free from mold, and shall not become a source of food and shelter for insects.

2.2.5 Factory Color Finish

Panels shall have a factory applied polyvinylidene fluoride finish on the exposed side. The exterior finish shall consist of a baked-on topcoat with an appropriate prime coat. Color shall match the color indicated in Section 09915 COLOR SCHEDULE. The exterior coating shall be a nominal 1 mil thickness consisting of a topcoat of not less than 0.7 mil dry film thickness and the paint manufacturer's recommended primer of not less than 0.2 mil thickness. The interior color finish shall consist of the same coating and dry film thickness as the exterior finish. The exterior color finish shall meet the test requirements specified below.

2.2.5.1 Salt Spray Test

A sample of the sheets shall withstand a salt spray test for a minimum of 1000 hours in accordance with ASTM B 117, including the scribe requirement in the test. Immediately upon removal of the panel from the test, the coating shall receive a rating of not less than 8F, few No. 8 blisters, as determined by ASTM D 714; and a rating of 6, 1/8 inch failure at scribe, as determined by ASTM D 1654.

2.2.5.2 Formability Test

When subjected to testing in accordance with ASTM D 522 Method B, 1/8 inch diameter mandrel, the coating film shall show no evidence of cracking to the naked eye.

2.2.5.3 Accelerated Weathering, Chalking Resistance and Color Change

A sample of the sheets shall be tested in accordance with ASTM D 4587, test condition B. The coating shall withstand the weathering test without cracking, peeling, blistering, loss of adhesion of the protective coating, or corrosion of the base metal. Protective coating that can be readily removed from the base metal with tape in accordance with ASTM D 3359, Test Method B, shall be considered as an area indicating loss of adhesion. Following the accelerated weathering test, the coating shall have a chalk rating not less than No. 8 in accordance with ASTM D 4214 test procedures, and the color change shall not exceed 5 CIE or Hunter Lab color difference (delta E) units in accordance with ASTM D 2244. For sheets required to have a low gloss finish, the chalk rating shall be not less than No. 6 and

the color difference shall be not greater than 7 units.

2.2.5.4 Humidity Test

When subjected to a humidity cabinet test in accordance with ASTM D 2247 for 1000 hours, a scored panel shall show no signs of blistering, cracking, creepage or corrosion.

2.2.5.5 Impact Resistance

Factory-painted sheet shall withstand direct and reverse impact in accordance with ASTM D 2794 0.500 inch diameter hemispherical head indenter, equal to 1.5 times the metal thickness in mils, expressed in inch-pounds, with no loss of adhesion.

2.2.5.6 Abrasion Resistance Test

When subjected to the falling sand test in accordance with ASTM D 968, Method A, the coating system shall withstand a minimum of 50 liters of sand before the appearance of the base metal. The term "appearance of base metal" refers to the metallic coating on steel or the aluminum base metal.

2.2.5.7 Pollution Resistance

Coating shall show no visual effects when covered spot tested in a 10 percent hydrochloric acid solution for 24 hours in accordance with ASTM D 1308.

2.2.6 Accessories

Flashing, trim, metal closure strips and curbs, fascia, caps, diverters, and similar metal accessories shall be the manufacturer's standard products. Exposed metal accessories shall be finished to match the building finish. Molded closure strips shall be bituminous-saturated fiber, closed-cell or solid-cell synthetic rubber or neoprene, or polyvinyl chloride premolded to match configuration of the roofing or siding and shall not absorb or retain water.

2.3 FASTENERS

Fasteners for steel wall panels shall be zinc-coated steel, aluminum, corrosion resisting steel, or nylon capped steel, type and size specified below or as otherwise approved for the applicable requirements. Fasteners for aluminum wall panels shall be aluminum or corrosion resisting steel. Fasteners for attaching wall panels to supports shall provide both tensile and shear strength of not less than 750 lbs per fastener. Fasteners for accessories shall be the manufacturer's standard. Exposed wall fasteners shall be color finished or provided with plastic color caps to match the covering. Non penetrating fastener system for wall panels using concealed clips shall be manufacturer's standard for the system provided.

2.3.1 Screws

Screws shall be as recommended by the manufacturer to meet the design strength requirements.

2.3.2 End-Welded Studs

Automatic end-welded studs shall be shouldered type with a shank diameter

of not less than 3/16 inch and cap or nut for holding covering against the shoulder.

2.3.3 Explosive Actuated Fasteners

Fasteners for use with explosive actuated tools shall have a shank of not less than 0.145 inch with a shank length of not less than 1/2 inch for fastening panels to steel and not less than 1 inch for fastening panels to concrete.

2.3.4 Blind Rivets

Blind rivets shall be aluminum with 3/16 inch nominal diameter shank or stainless steel with 1/8 inch nominal diameter shank. Rivets shall be threaded stem type if used for other than the fastening of trim. Rivets with hollow stems shall have closed ends.

2.3.5 Bolts

Bolts shall be not less than 1/4 inch diameter, shouldered or plain shank as required, with proper nuts.

2.4 GUTTERS AND DOWNSPOUTS

Gutters and downspouts shall be fabricated of aluminum, zinc-coated steel or aluminum-zinc alloy coated steel and shall have manufacturer's factory color finish. Minimum uncoated thickness of materials shall be 0.018 inch for steel and 0.032 inch for aluminum. All accessories necessary for the complete installation of the gutters and downspouts shall be furnished. Accessories shall include gutter straps, downspout elbows, downspout straps and fasteners fabricated from metal compatible with the gutters and downspouts. Downspouts shall be an open-faced type as shown on the drawings.

2.5 LOUVERS

Louvers shall be fabricated of aluminum, zinc-coated steel, or aluminum-zinc alloy coated steel; shall have manufacturer's factory color finish; and shall be furnished with bird screens. Minimum uncoated thickness of materials shall be 0.048 inch for steel and 0.064 inch for aluminum. Manually operated louvers shall be designed to be opened and closed from the operating floor.

2.6 SEALANT

Sealant shall be an elastomeric type containing no oil or asphalt. Exposed sealant shall be clear and shall cure to a rubber like consistency.

2.7 GASKETS AND INSULATING COMPOUNDS

Gaskets and insulating compounds shall be nonabsorptive and suitable for insulating contact points of incompatible materials. Insulating compounds shall be non running after drying.

2.8 SOFFIT PANELS, FASCIA and TRIM

Exterior soffits shall consist of 0.32 ga. aluminium or 0.024 ga. steel panels as follows:

Panel Length:	as shown on the drawings,
Panel Width:	as standard with manufacturer,however, not greater than 1'-0",
Panel Depth:	1 inch minimum,
Finish:	factory applied, manufacturer's standard fluroplymer (Knyar) or siliconized polyester coating; color as specified in SECTION 09915,
Appearance:	panels shall have a rigid embossed texture to provide an overall flat appearance (no vents), panel shall have reveals (grooves) at a minimum 4" distance,
Connections:	panels shall have concealed fasteners and be self-venting.

Gable and eave trim, ridge caps, fascia closure strips, and rake flashing shall be a minimum 0.032 ga. aluminium or 0.024 ga. steel (uncoated). Systems shall be as follows:

Panel Length:	as shown on the drawings,
Panel Width:	as standard with manufacturer,however, shall use one piece systems when possible,
Finish:	factory applied, manufacturer's standard fluroplymer (Knyar) or siliconized polyester coating; color as specified in SECTION 09915,
Appearance:	panels shall have a smooth (non-embossed) texture,
Connections:	trim panels shall have concealed fasteners and overlaps with sealant and gasketing fittings.

PART 3 EXECUTION

3.1 ERECTION

Dissimilar materials which are not compatible when contacting each other shall be insulated from each other by means of gaskets or insulating compounds. Improper or mislocated drill holes in panels shall be plugged with an oversize screw fastener and gasketed washer; however, panels with an excess of such holes or with such holes in critical locations shall not be used. Exposed surfaces shall be kept clean and free from sealant, metal cuttings, excess material from thermal cutting, and other foreign materials. Exposed surfaces which have been thermally cut shall be finished smooth within a tolerance of 1/8 inch. Stained, discolored or damaged sheets shall be removed from the site. Welding of steel shall conform to AWS D1.1; welding of aluminum shall conform to AA-02.

3.1.1 Siding Installation

Siding shall be applied with the longitudinal configurations in the vertical position. Accessories shall be fastened into framing members, except as otherwise approved. Closure strips shall be provided as indicated and where necessary to provide weathertight construction. Fastener and fastener spacing shall be in accordance with manufacture design. Panel installation shall not exceed .01 cfm per sq. ft. of wall area when tested in accordance with ASTM E-283-73 at a pressure differential of 20.0 psf. In addition, there shall be no uncontrolled water penetration of panels when tested in accordance with ASTM E-331-70 at a pressure differential of 7.0 psf.

3.1.2 Installation of Gutters and Downspouts

Gutters and downspouts shall be rigidly attached to the building. Spacing of cleats for gutters shall be 16 inches maximum. Spacing of brackets and

spacers for gutters shall be 36 inches maximum. Supports for downspouts shall be spaced according to manufacturer's recommendations.

3.1.3 Louvers

Louvers shall be rigidly attached to the supporting construction to assure a weather tight installation.

3.2 METAL SOFFIT, FASCIA and TRIM

Manufacturer's standard soffit, fascia and trim panel systems shall be assembled and installed in strict compliance with manufacturer's installation instructions. All metal fascia and trim related to the weathertightness of the roofing system shall be compatible with the roofing manufacturer instructions and warranty requirements- see SECTION: 07416A STRUCTURAL STANDING SEAM METAL ROOF (SSMR) SYSTEM for additional information.

3.3 FIELD PAINTING

Immediately upon detection, abraded or corroded spots on shop-painted surfaces shall be wire brushed and touched up with the same material used for the shop coat. Factory color finished surfaces shall be touched up as necessary with the manufacturer's recommended touch-up paint.

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
BUILDING SYSTEM COMPONENT

FACILITY
DESCRIPTION:_____

BUILDING
NUMBER:_____

CORPS OF ENGINEERS CONTRACT
NUMBER:_____

CONTRACTOR

CONTRACTOR:_____
ADDRESS:_____

POINT OF
CONTACT:_____

TELEPHONE
NUMBER:_____

OWNER

OWNER:_____

ADDRESS:_____

POINT OF
CONTACT:_____

TELEPHONE
NUMBER:_____

CONSTRUCTION AGENT

CONSTRUCTION
AGENT:_____
ADDRESS:_____

POINT OF CONTACT:_____

TELEPHONE
NUMBER:_____

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
BUILDING SYSTEM COMPONENT
(continued)

THE BUILDING SYSTEM COMPONENT INSTALLED ON THE ABOVE NAMED BUILDING IS WARRANTED BY (_____) FOR A PERIOD OF FIVE (5) YEARS AGAINST WORKMANSHIP AND MATERIAL DEFICIENCIES, WIND DAMAGE AND STRUCTURAL FAILURE WITHIN PROJECT SPECIFIED DESIGN LOADS, AND LEAKAGE. THE BUILDING SYSTEM COVERED UNDER THIS WARRANTY SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING: SIDING PANELS AND SEAMS, EXTERIOR GUTTERS AND DOWNSPOUTS, ACCESSORIES, TRIM, FLASHINGS AND MISCELLANEOUS BUILDING CLOSURE ITEMS, CONNECTORS, COMPONENTS, AND FASTENERS, AND OTHER SYSTEM COMPONENTS AND ASSEMBLIES INSTALLED TO PROVIDE A WEATHERTIGHT SYSTEM; AND ITEMS SPECIFIED IN OTHER SECTIONS OF THESE SPECIFICATIONS THAT BECOME PART OF THE METAL BUILDING SYSTEM. ALL MATERIAL AND WORKMANSHIP DEFICIENCIES, SYSTEM DETERIORATION CAUSED BY EXPOSURE TO THE ELEMENTS AND/OR INADEQUATE RESISTANCE TO SPECIFIED SERVICE DESIGN LOADS, WATER LEAKS AND WIND DAMAGE SHALL BE REPAIRED AS APPROVED BY THE CONTRACTING OFFICER

ALL MATERIAL DEFICIENCIES, WIND DAMAGE, STRUCTURAL FAILURE AND LEAKAGE ASSOCIATED WITH THE BUILDING SYSTEM COMPONENTCOVERED UNDER THIS WARRANTY SHALL BE REPAIRED AS APPROVED BY THE CONTRACTING OFFICER. THIS WARRANTY SHALL COVER THE ENTIRE COST OF REPAIR OR REPLACEMENT, INCLUDING ALL MATERIAL, LABOR, AND RELATED MARKUPS. THE ABOVE REFERENCED WARRANTY COMMENCED ON THE DATE OF FINAL ACCEPTANCE ON (_____) AND WILL REMAIN IN EFFECT FOR STATED DURATION FROM THIS DATE.

SIGNED, DATED, AND NOTARIZED (BY COMPANY PRESIDENT)

_____

(Company President) (Date)

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
BUILDING SYSTEM COMPONENTS
(continued)

THE CONTRACTOR SHALL SUPPLEMENT THIS WARRANTY WITH WRITTEN WARRANTIES FROM THE MANUFACTURER AND/OR INSTALLER OF THE BUILDING SYSTEM COMPONENT, WHICH SHALL BE SUBMITTED ALONG WITH THE CONTRACTOR'S WARRANTY. HOWEVER, THE CONTRACTOR WILL BE ULTIMATELY RESPONSIBLE FOR THIS WARRANTY AS OUTLINED IN THE SPECIFICATIONS AND AS INDICATED IN THIS WARRANTY.

EXCLUSIONS FROM COVERAGE

1. NATURAL DISASTERS, ACTS OF GOD (LIGHTNING, FIRE, EXPLOSIONS, SUSTAINED WIND FORCES IN EXCESS OF THE DESIGN CRITERIA, EARTHQUAKES, AND HAIL).

2. ACTS OF NEGLIGENCE OR ABUSE OR MISUSE BY GOVERNMENT OR OTHER PERSONNEL, INCLUDING ACCIDENTS, VANDALISM, CIVIL DISOBEDIENCE, WAR, OR DAMAGE CAUSED BY FALLING OBJECTS.

3. DAMAGE BY STRUCTURAL FAILURE, SETTLEMENT, MOVEMENT, DISTORTION, WARPAGE, OR DISPLACEMENT OF THE BUILDING STRUCTURE OR ALTERATIONS MADE TO THE BUILDING.

4. CORROSION CAUSED BY EXPOSURE TO CORROSIVE CHEMICALS, ASH OR FUMES GENERATED OR RELEASED INSIDE OR OUTSIDE THE BUILDING FROM CHEMICAL PLANTS, FOUNDRIES, PLATING WORKS, KILNS, FERTILIZER FACTORIES, PAPER PLANTS, AND THE LIKE.

5. FAILURE OF ANY PART OF THE BUILDING SYSTEM DUE TO ACTIONS BY THE OWNER WHICH INHIBIT FREE DRAINAGE FROM THE ROOF, AND GUTTERS AND DOWNSPOUTS; OR CONDITIONS WHICH CREATE PONDING WATER ON THE ROOF OR AGAINST THE BUILDING SIDING.

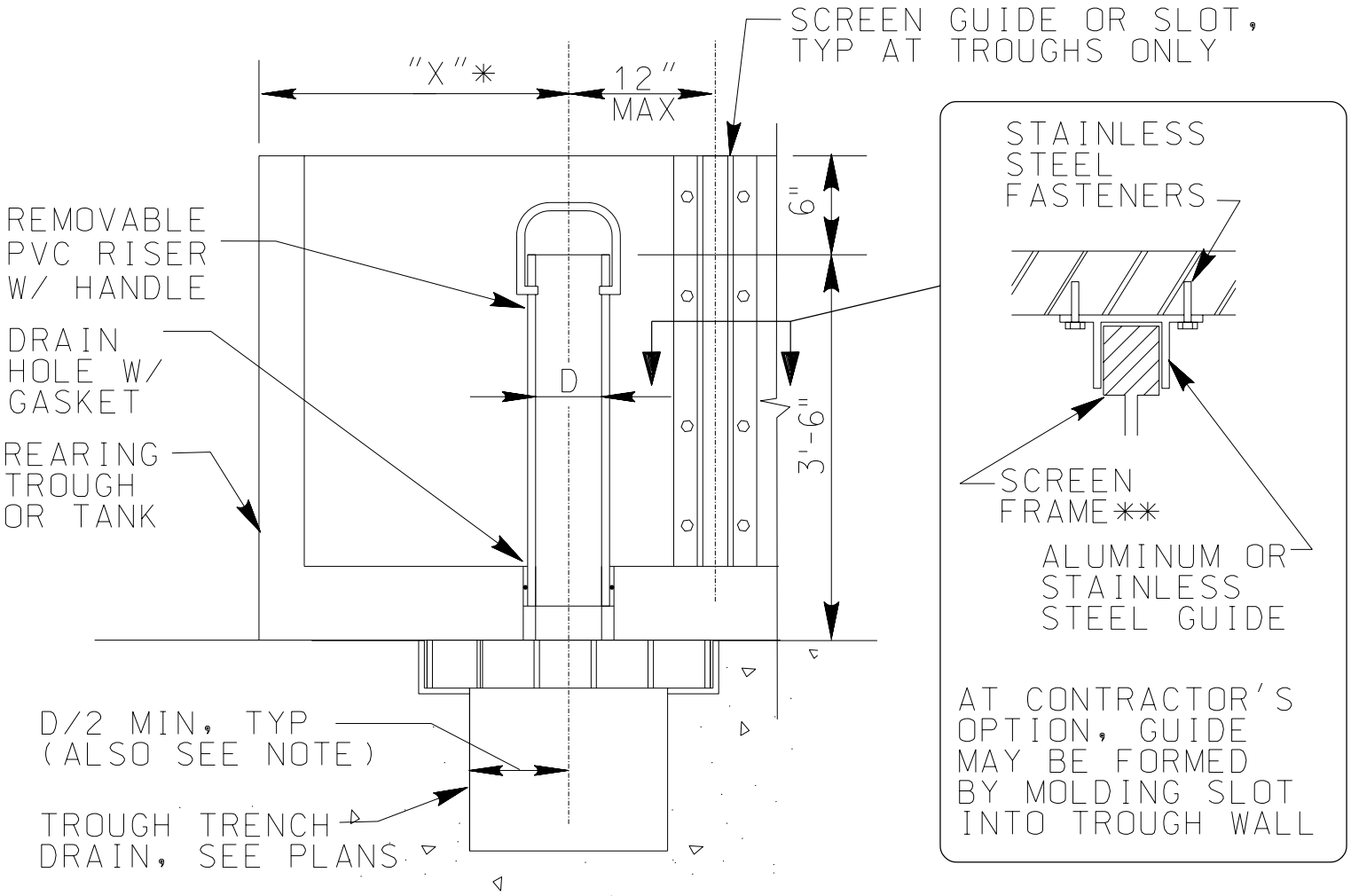
6. THIS WARRANTY APPLIES TO THE BUILDING SYSTEM. IT DOES NOT INCLUDE ANY CONSEQUENTIAL DAMAGE TO THE BUILDING INTERIOR OR CONTENTS WHICH IS COVERED BY THE WARRANTY OF CONSTRUCTION CLAUSE INCLUDED IN THIS CONTRACT.

7. THIS WARRANTY CANNOT BE TRANSFERRED TO ANOTHER OWNER WITHOUT WRITTEN CONSENT OF THE CONTRACTOR AND THIS WARRANTY AND THE CONTRACT PROVISIONS WILL TAKE PRECEDENCE OVER ANY CONFLICTS WITH STATE STATUTES. REPORTS OF LEAKS AND BUILDING SYSTEM DEFICIENCIES SHALL BE RESPONDED TO WITHIN 48 HOURS OF RECEIPT OF NOTICE BY TELEPHONE OR IN WRITING FROM EITHER THE OWNER, OR CONTRACTING OFFICER. EMERGENCY REPAIRS, TO PREVENT FURTHER ROOF LEAKS, SHALL BE INITIATED IMMEDIATELY; A WRITTEN PLAN SHALL BE SUBMITTED FOR APPROVAL TO REPAIR OR REPLACE THIS SSSMR SYSTEM WITHIN SEVEN CALENDAR DAYS. ACTUAL WORK FOR PERMANENT REPAIRS OR REPLACEMENT SHALL BE STARTED WITHIN 30 DAYS AFTER RECEIPT OF NOTICE, AND COMPLETED WITHIN A REASONABLE TIME FRAME. IF THE CONTRACTOR FAILS TO ADEQUATELY RESPOND TO THE WARRANTY PROVISIONS, AS STATED

CONTRACTOR'S FIVE (5) YEAR NO PENAL SUM WARRANTY
FOR
BUILDING SYSTEM COMPONENTS
(Exclusions from Coverage Continued)

IN THE CONTRACT AND AS CONTAINED HEREIN, THE CONTRACTING OFFICER MAY HAVE THE BUILDING SYSTEM COMPONENTREPLACED OR REPAIRED BY OTHERS AND CHARGE THE COST TO THE CONTRACTOR. IN THE EVENT THE CONTRACTOR DISPUTES THE EXISTENCE OF A WARRANTABLE DEFECT, THE CONTRACTOR MAY CHALLENGE THE OWNER'S DEMAND FOR REPAIRS AND/OR REPLACEMENT DIRECTED BY THE OWNER OR CONTRACTING OFFICER EITHER BY REQUESTING A CONTRACTING OFFICER'S DECISION, UNDER THE CONTRACT DISPUTES ACT, OR BY REQUESTING THAT AN ARBITRATOR RESOLVE THE ISSUE. THE REQUEST FOR AN ARBITRATOR MUST BE MADE WITHIN 48 HOURS OF BEING NOTIFIED OF THE DISPUTED DEFECTS. UPON BEING INVOKED THE PARTIES SHALL, WITHIN 10 DAYS JOINTLY REQUEST A LIST OF FIVE (5) ARBITRATORS FROM THE FEDERAL MEDIATION AND CONCILIATION SERVICE. THE PARTIES SHALL CONFER WITHIN 10 DAYS AFTER RECEIPT OF THE LIST TO SEEK AGREEMENT ON AN ARBITRATOR. IF THE PARTIES CANNOT AGREE ON AN ARBITRATOR, THE CONTRACTING OFFICER AND THE PRESIDENT OF THE CONTRACTOR'S COMPANY WILL STRIKE ONE (1) NAME FROM THE LIST ALTERNATIVELY UNTIL ONE NAME REMAINS. THE REMAINING PERSON SHALL BE THE DULY SELECTED ARBITRATOR. THE COSTS OF THE ARBITRATION, INCLUDING THE ARBITRATOR'S FEE AND EXPENSES, COURT REPORTER, COURTROOM OR SITE SELECTED ETC., SHALL BE BORNE EQUALLY BETWEEN THE PARTIES. EITHER PARTY DESIRING A COPY OF THE TRANSCRIPT SHALL PAY FOR THE TRANSCRIPT. A HEARING WILL BE HELD AS SOON AS THE PARTIES CAN MUTUALLY AGREE. A WRITTEN ARBITRATOR'S DECISION WILL BE REQUESTED NOT LATER THAN 30 DAYS FOLLOWING THE HEARING. THE DECISION OF THE ARBITRATOR WILL NOT BE BINDING; HOWEVER, IT WILL BE ADMISSIBLE IN ANY SUBSEQUENT APPEAL UNDER THE CONTRACT DISPUTES ACT. A FRAMED COPY OF THIS WARRANTY SHALL BE POSTED IN THE MECHANICAL ROOM OR OTHER APPROVED LOCATION DURING THE ENTIRE WARRANTY PERIOD.

-- End of Section --



* AT TROUGHS X=APPROX 1'-4", AT TANKS X=TANK RADIUS. CONTRACTOR SHALL COORDINATE EXACT LOCATION OF DRAIN WITH TRENCH POSITION. DISCHARGE SHALL BE WITHIN WIDTH OF TRENCH BUT NEED NOT BE CENTERED.

** PROVIDE ONE SCREEN PER TROUGH PLUS 10 SPARES. SCREEN MATERIAL AND FABRICATION SHALL BE SIMILAR TO DETAIL ON S8.06 OR AS APPROVED. SUBMIT SCREEN DETAILS FOR APPROVAL.

TROUGH & TANK DRAIN SECTION

9

M7.01 | M8.05
M7.02
M7.03

NO SCALE

ADD DETAIL TO SHEET M8.05